ST. LOUIS SOUTHWESTERN RAILWAY UNDERPASS
Dart Railroad Underpass
Texas Historic Bridges Recording Project II
Spanning State Hwy. 183 at the DART Railroad
Fort Worth
Tarrant County
Texas

HAER No. TX-94

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD

ST. LOUIS SOUTHWESTERN RAILWAY UNDERPASS
(DART Railroad Underpass) HAER No. TX-94

Location:	Spanning S.H. 183 at DART Railroad in Fort Worth, Tarrant County, Texas UTM: 14/655658/3629620 USGS Quad: Fort Worth, Tex.
Date of Construction:	1935
Designer:	George G. Wickline, Texas Highway Department; and Office of Chief Engineer, St. Louis Southwestern Railway, Tyler Texas
Builder/Contractor:	Butcher-Sweeney, Contractors; Fort Worth, Texas
Present Use:	Railroad underpass
Significance:	An example of Fort Worth's exceptional network of grade separation structures, the underpass serves as a good example of a cooperative effort by the Texas Highway Department and the U.S. Bureau of Public Roads to eliminate dangerous grade crossings in Texas during the Great Depression.
Historian:	Robert W. Jackson, Ph.D., August 2000
Project Information:	This document was prepared as part of the Texas Historic Bridges Recording Project II performed during the summer of 2000 by the Historic American Engineering Record (HAER). The project was sponsored by the Texas Department of Transportation (TxDOT), Environmental Affairs Division.

The St. Louis Southwestern Railway Underpass at State Highway S. H. 183 in Fort Worth, Texas, was built in 1935 to span tracks of the St. Louis Southwestern Railway. The Texas Highway Department and the U.S. Bureau of Public Roads constructed it as part of a systematic attempt during the 1930s to improve urban-area grade separation structures. This effort was in response to an explosive growth in automobile and truck traffic during the early decades of the twentieth century, which led to dangerous conflicts at points of intersection between road and rail transportation systems.

The roots of this conflict in the Fort Worth area may be traced to the rail promotion activities of civic, business, and political leader Buckley Burton Paddock (1844-1922). As editor of the Fort Worth *Democrat*, Paddock published the so-called "Tarantula Map" on 26 July 1873, which depicted nine railroad lines radiating like a spider's legs from Fort Worth. Although there were no railroads terminating in Fort Worth when the map was first published, it served as a visual representation of the hope that Paddock and other civic boosters had for their city's future.

Due in large part to Paddock's vigorous promotion at the local, state, and national levels, the Texas & Pacific Railroad succeeded in completing the first rail line into Fort Worth on 19 July 1876. Seven other railroads entered the city during the following decade, including the St. Louis, Arkansas & Texas Railway in 1888. The St. Louis Southwestern Railway Company of Texas was formed by the St. Louis Southwestern Railway Company, commonly called the Cotton Belt, in 1891 to acquire the assets of the St. Louis, Arkansas & Texas Railway. This explains why the identification "COTTON BELT ROUTE" may be seen on the steel girder spans of the underpass. Arrival of the International & Great Northern Railroad in 1903 essentially completed the network of railroads envisioned by Paddock in 1873.[1] This pattern of rail lines was therefore well established by the beginning of the automobile age.

A rapid increase in automobile ownership during the first two decades of the twentieth century led to a dramatic rise in fatalities and serious injuries at points where rail lines crossed roads. Warning signs were often inadequate or non-existent, and the motoring public was generally ignorant of the danger posed by trains. Construction of grade separation structures was very expensive, however, and the cost of separating grades at every point of intersection was prohibitive. Improving signs and signals was therefore the commonly selected method of reducing accidents at crossings in rural and suburban areas where traffic counts were relatively low.

The official U.S. census of 1920, however, revealed that a majority of the nation's population had become urban by the beginning of the third decade of the twentieth century. As Americans became more urbanized, they were also becoming more prosperous, and thus better able to purchase expensive consumer goods such as automobiles.

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[1] Marcelle Hull, "B. B. Paddock and the Railroads of Fort Worth," *The Compass Rose* 9, no. 1 (Spring 1995), 1-5; Ron Tyler, ed., *The New Handbook of Texas,* vol. 5 (Austin, Tex.: Texas State Historical Association, 1996), 5; Charles P. Zlatkovich, *Texas Railroads: A Record of Construction and Abandonment* (Austin, Tex.: Bureau of Business Research, University of Texas at Austin, 1981), 64, 67.

After a brief depression following the end of the First World War, the United States experienced a period of economic expansion that began about 1922, peaked in 1927, and lasted until the beginning of the Great Depression in 1929. This period marked the climax of the so-called "second industrial revolution," an era in which the nation's industrial output nearly doubled and the gross national product rose by approximately forty percent. Electrification, new technologies, more efficient manufacturing methods, and innovative advertising fueled the rise in the consumer-goods economy that gave Americans the highest standard of living in the world.[2]

Automobile manufacturing had already become the nation's largest industry by 1920, and continued to experience spectacular growth throughout the decade. In 1920, there were 9,239,100 motor vehicle registrations in the United States; by 1930, the total had increased to 26,749,800. With more cars and trucks on the road, more and better highways were required, and millions of dollars were spent during the 1920s to upgrade the nation's road system. The pace of road improvement did not keep pace with the rise in automobile ownership, however. There were approximately 387,000 mile of paved roads in the United States in 1921, but the figure had increased to only 662,000 by 1929.[3]

Texas followed national trends with an increase in motor vehicle registrations from 430,377 in 1920, to 1,401,748 in 1930.[4] Moreover, these vehicles were traveling at a much higher rate of speed, thereby increasing the hazard to the motoring public. Unfortunately, increase in the number and speed of vehicles on the road in the 1920's exceeded the Texas Highway Department's capacity to keep pace with necessary highway improvements. As later noted by an article published in *Texas Parade*, the official publication of the Texas Good Roads Association, during this period "more vehicles, traveling more miles, were turned loose on an already inadequate highway system."[5]

When traffic on the state's highways during the earliest years of the century was relatively light and the average speed relatively low, there seemed to be little need for the construction of grade separation structures, except in those cases where a major highway or trunk line railroad with very heavy traffic was involved.[6] Because grade separation structures were very expensive, the Texas Highway Department generally elected to provide for increased safety of the motoring public by relocating highways, by improving the grade of the crossings, by

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[2] Robert A. Divine, ed., *America: Past and Present,* vol. 2, 2nd ed. (Glenview, Ill.: Scott, Foresman and Co., 1987), 723-24.

[3] Divine *America: Past and Present, 723-24*; Gary B. Nash and Julie Roy Jeffrey, eds., *The American People: Creating a Nation and a Society,* vol. 2 (New York: Harper & Row, 1986), 761-62.

[4] *Texas Highway Department Ninth Biennial Report: September 1, 1932 to August 31, 1934* (Austin, Tex.: Texas Highway Department, 1934), 31.

[5] Charles E. Simmons, "Engineering Death Off the Highways," *Texas Parade* (August 1938), 16.

[6] H. H. Allen, ed., *Texas Highway Department: 1927-1937* (Austin, Tex.: Texas Highway Department, 1937), 113.

cutting brush to increase sight distance, or by erecting more effective warning signs.[7] But as the number of accidents involving injury or death at highway-railroad crossings in Texas rose steadily from 201 incidents (68 fatalities) in 1920 to 350 incidents (152 fatalities) in 1929, the importance of separating the grades of highways and rail lines became more apparent.[8]

In 1923, the Texas Railroad Commission collected data from railroad companies operating in the state and found that there were 9,313 public road and farm crossings and 533 street crossings in Texas, but only 165 overpasses and underpasses. Most of the crossing elimination achieved up to this time was due to road relocation, with some of the cost covered by federal funds made available under provisions of the various Federal Aid Acts passed beginning in 1916.

During the 1920's, some of the leading railroad companies began to employ engineers for the special purpose of conferring with state and county officials on the construction of grade separation structures. But cost participation by the railroads during this period was entirely voluntary.[9] Prior to 1925, when the state or a county desired construction of a grade separation structure, a plan was submitted to the railroad and negotiations were begun regarding the design and cost. Generally, the railroad paid one-half of the cost on any portion of the project within railroad right-of-way, but only contributed about one-third of the cost for work outside their right-of-way.

In 1925, the Texas legislature passed laws by which the county were relieved of construction responsibilities, and from 1925 to 1932 the railroads and the state of Texas split the cost of grade crossing elimination. Passage of the Emergency Relief Appropriations Act of 1932 provided federal funds for the entire cost of grade separation structures, payable through the state.[10] The availability of federal funds allowed the Texas Highway Department and the U.S. Bureau of Public Roads to finally begin a systematic program of new construction and improvement of existing urban separation structures, and a great number were built in the 1930s.

Prior to 1932, the individual railroad company involved prepared plans for an underpass and performed the work itself. After the work was completed and inspected, the state reimbursed the railroad based on the formula agreed to before commencement of construction. In the case of the overpass, the state prepared the design and an outside contractor performed the actual work of construction in the same manner as any other state highway improvement project. After 1932, the state generally accepted responsibility for preparation of a preliminary plan, which was then submitted to the railroad. With input from the U.S. Bureau of Public Road, the railroad then

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[7] G. G. Wickline, "Grade Crossing Elimination," *Texas Highway Bulletin 4* no. 1 (January 1924): 25; "Making Texas Highway Safe for Traffic with the Grade Crossing Eliminated," *Texas Highway Bulletin* 8, no. 4 (April 1928):9.

[8] Allen, *Texas Highway Department: 1927-1937*, 113; *Texas Highway Department Ninth Biennial Report: September 1, 1932 to August 31, 1934* (Austin, Tex.: Texas Highway Department, 1934), 8.

[9] Wickline, G. G. "Grade Crossing Elimination."

[10] *Texas Highway Department Seventh Biennial Report: September 1, 1928 to August 31, 1930* (Austin, Tex.: Texas Highway Department, 1934), 56; Allen, 115.

prepared final plans for underpasses, and the state prepared final plans for overpasses. After the U.S. Bureau of Public roads approved a final design, an outside contractor performed the work under supervision by the state.[11]

The St. Louis & Southwestern Railway Underpass is located on S. H. 183, also known as NE 28th Street, approximately 1,500' east of the Stockyards Viaduct. Prior to the 1930s, NE 28th Street terminated short of the railroad tracks that now run underneath the viaduct. There was no east-west arterial north of Northside Drive, located several blocks south of the stockyards area. In order to improve the flow of east-west urban traffic, and to connect northern Fort Worth with points further east, the Texas Highway Department began a program in about 1933 to extend and improve NE 28th Street as S. H. 15. This involved the construction of several grade separation structures, including the St. Louis Southwestern Railway Underpass, the adjacent Fort Worth & Denver City Railway Underpass, the Stockyards Viaduct, and the Texas & Pacific Railway Overpass located further to the east, near Mt. Olivet Cemetery. Because this area was outside the Fort Worth city limits at that time, all of these projects were eligible for federal funding under provisions of the National Industrial Recovery Act (NIRA) of 1933. The St. Louis Southwestern Railway Underpass and the adjacent FW&DC Underpass were jointly designated as U.S. Public Works Project NRM 634-A, Part 1, indicating that they were part of the NIRA program for extension of the Federal Aid Highway System into and through municipalities. The Texas & Pacific Overpass was designated NRM 634-B, and the Stockyards Viaduct was designated NRM 634-C.

That portion of the proposed highway running under the underpass structures was designed for a 40'-0" road width from curb to curb, with a 1'-0" curb and a 5'-0" sidewalk on each side of the road. In order to provide for a minimum clearance of no less than 14"-0" between the bottom of the underpass girders and the crown of the road, without changing the grade of the railroad tracks, the road had to be placed in a cut. A storm sewer system that included concrete pipes under each underpass was installed to prevent accumulation of water at the low points of the roadway.

The deck is supported by six I-beam girders, each 46'-0" in length, spaced 2'-4" apart. The 14'-0" wide concrete deck slab is recessed to contain the ballast on which the cross ties rest. A 3'-9" wide sidewalk is located on the east side of the deck. Steel brackets, riveted to the outside girder, support the sidewalk and a steel handrail.

The girders rest on box-type concrete abutments that have interior spaces accommodating 5'-0" sidewalks, which are raised above and separated from the roadway by low retaining walls. The abutment has two, three-quarter height arched openings, each 3'-0" in width.

The underpass has 40'-0" of curb-to-curb horizontal clearance. The original minimum vertical clearance was 14'-6" from the bottom of the girders to the crown in the road. Steel pipe handrails, extending approximately 3' above the walkway, are located at both ends of each abutment and in each arched opening. Retaining walls rising from the sidewalk to the level of the rail deck, slope gently downward on each side. The abutments, roadway retaining walls, and outside retaining walls are scored to provide a bit of ornamental embellishment.

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[11] Allen, H. H. *Texas Highway Department: 1927-1937*, 116.

The structure maintains its integrity, and is significant as an example of a systematic attempt by the Texas Highway Department and the U.S. Bureau of Public Roads during the 1930s to improve urban grade separation structures in response to the explosive growth of automobile and truck traffic during the early decades of the twentieth century. It also serves as an example of the Depression-era Street and highway improvement building boom that helped make Fort Worth a modern metropolis.

SOURCES CONSULTED

Divine, Robert A., ed. *America: Past and Present.* Vol. 2. 2d ed. Glenview, Ill.: Scott, Foresman and Co., 1987.

Gilchrist, Gibb. *Texas Highway Department: 1927-1937.* Austin, Tex.: Texas Highway Department, 1937.

Hull, Marcelle. "B. B. Paddock and the Railroads of Fort Worth," *The Compass Rose* 9, no. 1 (Spring 1995).

Nash, Gary B. and Julie Roy Jeffrey, eds. *The American People: Creating a Nation and a Society.* Vol. 2. New York: Harper & Row, 1986.

Simmons, Charles E. "Engineering Death Off the Highways," *Texas Parade* (August 1938).

Texas Highway Department Ninth Biennial Report: September 1, 1932 to August 31, 1934. Austin, Tex.: Texas Highway Department, 1934.

Tyler, Ron, ed. *The New Handbook of Texas,* Vol. 5. Austin, Tex.: Texas State Historical Association, 1996.

Wickline, G. G. "Grade Crossing Elimination." *Texas Highway Bulletin.* 4, no. 1 (January 1924).

_____. "Making Texas Highway Safe for Traffic with the Grade Crossing Eliminated." *Texas Highway Bulletin* 8, no. 4 (April 1928).

Zlatkovich, Charles P. *Texas Railroads: A Record of Construction and Abandonment.* Austin, Tex.: Bureau of Business Research, University of Texas at Austin, 1981.